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### Note on the Flora of the Kittatinny Mountains.\*

In November, 1884, I communicated to the Torrey Club an account of some peculiarities of the Flora of the Kittatinny Mountains of Northwestern New Jersey.† I then called attention to the existence on these mountains of a number of plants whose ordinary habitat is in sandy soil near the Atlantic coast, and whose occurrence in the region under consideration was apparently attributable to the highly silicious character of the soil, which results from the decay of the sandstone and silicious conglomerate rock of Oneida age—the Shawangunk Grit—of which these mountains are composed. Among the species then noted were *Juncus Greenii*, Oakes and Tuckerm., *Solidago puberula*, Nutt., *Orontium aquaticum*, L., *Tephrosia Virginiana*, Pers., *Lespedeza hirta*, Ell., *Lupinus perennis*, L., *Quercus ilicifolia*, Wang., and the *Corema Conradii*, Torrey, of Lake Mohunk, the latter a few miles north of the New Jersey line in New York, but on the same mountain range. Since that time I have been able to make further exploration of the region and can furnish additional support to the position then taken.

At Culver's Gap, the first break in the range to the southwest of the depression through which the Erie railway is constructed, the conglomerate is well exposed, and here *Polygala polygama*, Walt., *Gerardia pedicularia*, L., and *Lechea racemulosa*, Michx., all abundant in sandy soil along the coast, occur plentifully. Here also grew *Prunus pumila*, L., before noted at High Point, and more commonly found on sandy river shores, though not a coast plant. On the mountains northwest of the Delaware Water Gap, I found, on July 4 of the present year, *Scleria pauciflora*, Muhl.

But the most interesting spot yet visited is a lake of some 200 acres in extent, called Sunfish Pond, four miles northwest of the Water Gap, near the very summit of the mountain. In shallow water along its shore, *Juncus militaris*, Bigel., was found. This species has never before been found so far away from the coast. The capillary sub-aqueous leaves had, at the time of collection

\* Read before the Biological Section, A. A. A. S., New York Meeting, August, 1887.

† Published in the BULLETIN of that month, vol. xi., pp. 126-128.

(July 5), become detached from the plants, but were seen floating and cast up on the shore; it had not yet come into flower. *Lycopodium inundatum*, L., occurs in wet sand on the shore; the plant regarded by Professor Tuckerman as var. *Bigelovii* of this species, is very plentiful in sandy bogs in eastern New Jersey, and differs from the northern and European plant mainly in its greater size; *Viburnum nudum*, L., was collected near by, and its var. *cassinoides*, Gray—for I cannot regard it as a species—grows at Lake Nascia near High Point. *V. nudum* is common in coast swamps.

*Aster linariifolius* is abundant all along the mountains, as in the sandy coast plains, while the almost impassable thickets of *Quercus ilicifolia*, Wang., make traveling difficult and often painful. The resemblance to the pine barren flora is also markedly apparent in the great abundance of Ericaceæ. *Gaylussacia resinosa*, Torrey & Gray, *G. frondosa*, Torrey & Gray, and *Vaccinium vacillans*, Sol., are all common to both regions and equally very abundant, while *Epigæa repens*, L., *Gaultheria procumbens*, L., whose habitat is not always "cool, damp woods," *Cassandra calyculata*, Don., and *Rhododendron viscosum*, Torrey, occur as well.

The floral resemblance here traced bears no relation to the geological age of the two regions, the coast plains being late Tertiary or Quaternary, the mountains Silurian. But there is another range of mountains parallel to the Kittatinny in New Jersey and southern New York, whose flora has many species in common with that of the latter. I refer to the ridges of the Green Pond System, known at Greenwood Lake as the Bearfort and Bellvale Mountains and in New York as the Skunnemunk. Here *Quercus ilicifolia*, the Blueberries and Huckleberries are very abundant; *Solidago puberula*, *Tephrosia*, *Lespedeza hirta*, *Arctostaphylos Uva-Ursi*, *Aster linariifolius* and other sand plants occur. The rock is a silicious conglomerate much resembling that of the Kittatinny, and was supposed by Mather, while prosecuting the Geological Survey of New York, to be of the same age, though his observations did not fully demonstrate the fact. Others have regarded these Green Pond Mountain conglomerates to be of several different ages, ranging from Pots-

dam to Triassic, but the recent field-work of Mr. F. J. H. Merrill leaves little doubt that they are what Mather supposed, and we have here a most interesting agreement of the floral features with the lithological.

N. L. BRITTON.

### A Meeting-place for two Floras.\*

BY CHARLES E. BESSEY.

About half-way across the northern part of Nebraska, a few miles east of the 100th meridian, there is a very interesting botanical locality. A small stream starts at a point about twenty or twenty-five miles south of the Niobrara River, and runs northward through a deep and winding cañon to the river mentioned. The surrounding country is absolutely treeless, and the surface is in many places thrown up into rounded hills of what must have once been drifting sand. The cañon sides are very abrupt, and they descend in many places fully two hundred feet before the bottom is reached. The stream is known to the whites as Long Pine Creek, but to the Indians it was the Wasahancha, which signifies "where the pines extend far out." Both names refer to the pines which have here a station so far removed from the mountains as to have attracted the attention of the Indians, as well as the early white settlers.

In this cañon, as I found in a recent visit, there is a blending of the Eastern and the Western floras in a most unusual way. The first thing that strikes the visitor is the fact that here are growing great numbers of Rocky Mountain pines (*Pinus ponderosa*, var. *scopulorum*). They are so abundant, and of such size that they are largely used in the neighborhood for lumber and for fuel. Subsequent examination of the country around shows that these pines are found along the streams or on the hills all the way up to the mountains of Wyoming, and they appear also to be connected with the heavy body of pine in the Black Hills in Dakota. There are none, however, eastward of this cañon, although the sides of the broad cañon of the Niobrara river, near the mouth of the creek, are dotted with scrubby pines. The Indian name of the creek—the Wasahancha—is therefore most appropriate: "where the pines extend far out."

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\* Read before the Botanical Club, A. A. A. S., at the N. Y. Meeting, August, 1887.